SECTION VI
ONLY PRACTICABLE ALTERNATIVE FINDING, FLOODPLAINS

Presidential Executive Order 11988 and 23 CFR 650 Subpart A require federal agencies to avoid the long- and short-term adverse impacts associated with the occupancy and modification of floodplains. In implementing the Executive Order, it is the Federal Highway Administration's (FHWA) policy to:

- Encourage prevention of uneconomic, hazardous or incompatible use and development in the floodplain.
- Avoid longitudinal or other significant encroachments where practicable.
- Minimize impacts that adversely affect base flood plains.
- Restore and preserve the natural and beneficial floodplain values.
- Avoid support of incompatible floodplain development.
- Be consistent with the intent of the Standards and Criteria of the National Flood Insurance Program and local floodplain management.

Three of the build alternatives in the Central Segment (Alternatives C2, C2(a), and C2(b)) involve transverse crossings in the floodplain of the Crawfish River. This encroachment may be considered a significant encroachment because there may be adverse impacts on natural floodplain values such as flood storage, open space and agriculture.

This section sets forth the basis for a finding that there is no practicable alternative to the construction of STH 26 improvements in the floodplain; that the highway proposal includes all practicable measures to minimize harm to these resources; and that the action will conform to applicable State and local floodplain protection standards.

6.1 REASONABLE ALTERNATIVES

As discussed in Section II, the alternative development process included scoping and preliminary development of a broad range of alternatives. Alternatives that were not feasible and reasonable were dismissed. Detailed study was then done for a range of reasonable alternatives. These detailed study alternatives, as well as other alternatives not selected for detailed study, are described in Section II.

Floodplain impacts occur only in the Central Segment. The regional (100-year) floodplain and Build Alternatives C1, C2, C2(a), C2(b), C3 and C4 are shown on Exhibit 6.

The draft Environmental Impact Statement (EIS) for this project was published in July of 2000. Following the public hearing, review agency comments and additional analysis, Alternative C2(a) with minor modifications from the alignment presented in the DEIS was identified as the Preferred Alternative in the Central Segment. The Preferred Alternative alignment is shown on Exhibit 8, which also shows the floodplain boundary.

6.2 FLOODPLAIN IMPACTS

Alternatives C2, C2(a), and C2(b) all have transverse crossings of the Crawfish River west of Jefferson that could potentially impact the floodplain. Floodplain encroachments can occur directly by construction of highway embankments, or indirectly through support of incompatible floodplain development. Alternatives C2 and C2(a) would have an interchange with USH 18 that would be situated in the Crawfish

River floodplain. This interchange would be located outside the floodway. This project will not support incompatible floodplain development for reasons discussed in Section 4.2.3.

The stream crossings involving floodplains are listed in Table 4.2.1.2 and are shown on Exhibit 6. New structures will be provided at each of the stream crossings on all of the build alternatives. For these alternatives, the proposed structures would be hydraulically designed to pass the regional (100-year) flood without raising the backwater elevation. Under the No-Build Alternative, existing STH 26 structures would remain in place, and no new structures would be built.

An analysis of the flood impacts was done for Alternatives C2, C2(a), and C2(b) in the Central Segment. The results of the analysis are presented in Table 4.2.3.3.

6.3 PREFERRED ALTERNATIVE

The Preferred Alternative C2(a) (see Exhibit 8) will raise the regional base flood elevation by approximately 0.08 feet (0.02 m) on the Crawfish River. It would not be possible or practicable to replace the loss of flow area or storage volume. To eliminate an increase would require a bridge spanning the entire width of the floodplain, which is not practical because of the high costs associated with constructing such a span.

Due to the confluence with the Rock River and the flat water surface profile of the Crawfish River, a slight increase (<0.1 foot) of the regional base flood elevation is expected to propagate upstream to IH 94. This will not result in a significant probability of flooding with potential for property loss or hazard to life, since no habitable buildings or other structures would be inundated by the raised base flood elevation. The increase would be so minimal that it would not be possible to measure the newly inundated area from topographic maps. The newly inundated area consists primarily of farmland with some small wetland and woodlot areas.

Channel mean flow velocities in the impacted area range from about 2 to 3 feet per second in the regional (100-year) event. Because the Crawfish River is in the outwash plain of the Rock River, the water surface profile is relatively flat in the project area. The project is not expected to increase the potential for erosion during major, infrequent flooding events. In the area of greatest effect from Alternative C2(a), the flow velocity will be increased from approximately 2.3 feet per second to 3.0 feet per second. Effects on flood elevation and velocity are negligible downstream of project areas.

The proposed highway will be designed to have adequate freeboard to prevent encroachment of water on the pavement in the regional (100-year) flood event. Freeboard is a flood protection elevation designed as a factor of safety and expressed as a specified distance above the calculated flood level.

The project will have no effect on normal flows occurring within the stream banks, and only minimal effect on velocities in the floodway during major flooding events. Therefore, the Preferred Alternative will not substantially affect water quality protection, or recreational uses of the river. The increase in the base flood elevation will have minimal impact on other natural and beneficial floodplain values such as fisheries or vegetation. Habitat loss will occur primarily in the directly impacted wetlands associated with the floodplain.

In addition to the regional (100-year) flood, adverse impacts can occur due to lesser magnitude floods that recur more frequently, with the principal concern being crop damage. Hydraulic analysis indicates that in the 10-year storm event (an event having a 10 percent probability of occurring in any given year),

Alternative C2(a) will raise the flood height of the Crawfish River by a maximum of approximately 0.04 foot (0.01 m) compared to the No-Build Alternative. The Preferred Alternative would not affect the frequency of over bank flooding, and would have negligible effect on the duration of time that surface water remains standing.

6.4 DETERMINATION OF NO PRACTICABLE ALTERNATIVE

Floodplain impacts, as well as the other impacts of each alternative are discussed in detail in Section IV, and these impacts are summarized in Table 4.2.3.3. The following discussion of other reasonable alternatives provides the basis for the conclusion that there is no practicable alternative to the floodplain impacts of the Preferred Alternative.

6.4.1 No-Build Alternative

The No-Build Alternative is defined as no improvements other than normal pavement maintenance or localized upgrades. The No-Build Alternative will not impact floodplains or affect natural and beneficial floodplain values.

The No-Build Alternative does not meet the purpose and need for this project and does not address the numerous deficiencies of the existing facility outlined in Section I. There would be no increase in traffic capacity, or improvement of flow characteristics or route safety. There would be no beneficial impacts on regional economic development. For these reasons, the No-Build Alternative is not considered a practicable alternative to avoid the floodplain impacts of the Preferred Alternative.

6.4.2 Build Alternatives

6.4.2.1 Alternative C1

Alternative C1 avoids all floodplain impacts, but it was eliminated from further consideration because it lacks several benefits provided by other Central Segment alternatives:

- Alternative C1 has greater farmland (438 acres, 177 ha) and wetlands (24 acres, 10 ha) impacts than Alternatives C2, C2(a), and C2(b) (approximately 350 acres (142 ha) and 20 acres (8 ha)). The Preferred Alternative C2(a) alignment as modified since the publication of the DEIS has wetland impacts of 15.2 acres (6.2 ha).

- Some of the farmland associated with Alternative C1 is outside Jefferson's Urban Service Area boundaries and would therefore have a longer-term impact on agricultural lands.

- Alternative C1 received little support from the general public or local officials.

6.4.2.2 Alternatives C2, C2(a), C2(b), and C3

Alternatives C2, C2(a), and C2(b), and in particular Alternative C2(a), are preferred as they provide transportation and other benefits that Alternative C3 does not provide. Among these are the following:

- Traffic flow is generally more oriented to USH 18 to the west to Madison and STH 89 to Lake Mills than it is to USH 18 to the east towards Helenville. Alternatives C2, C2(a), and C2(b) facilitate this desired westerly traffic flow and allow STH 89 to be rerouted along the new and safer West Bypass.

The existing STH 89 route is an old curvy county highway route. The existing STH 89 could then revert back to a local road.

- Three schools (high, middle and elementary) are located just east of the Crawfish River. The Jefferson Performing Arts Center with regularly scheduled performances is located at the high school. The County Fairgrounds has over 150 scheduled events throughout the year, some which attract upwards of 40-50,000 daily visitors. These land uses generate substantial daily and special event traffic and truck volumes from outside the City of Jefferson, and would be best served by Alternatives C2, C2(a), and C2(b).

- Alternatives C2, C2(a), and C2(b) eliminate the safety concerns over pedestrian circulation in and around the St. Coletta properties east of Jefferson, and eliminate potential disruption to the organization's operational characteristics and rural setting.

- Alternatives C2, C2(a), and C2(b) would have access at USH 18 with a diamond interchange. Alternative C3 would access at USH 18 with a partial cloverleaf interchange to better address the pedestrian safety for attendees of St. Coletta. A diamond interchange is more easily understood by the traveling motorist, and requires less land to construct than a partial cloverleaf interchange.

- USH 18 on the west side of the city has an existing 80-foot right-of-way width as compared to 66 feet on the east side of the city. The wider width on the west side permits safer movement of traffic between the downtown area and the bypass, and more easily accommodates future traffic growth and roadway improvements without affecting abutting properties.

- Alternatives C2 and C2(b) impact about half the amount of wetland as compared to Alternative C3 (19 acres (8 ha) versus 31 acres (13 ha)). The Preferred Alternative C2(a) alignment as modified since the publication of the DEIS further has wetland impacts of 15.2 acres (6.2 ha).

- The Alternatives C2, C2(a), and C2(b) proposed bridge crossing of the Crawfish River would have no effect on normal flows occurring within the stream banks, but would have a minimal impact on the adjacent floodplain. Alternative C2(a) is expected to raise the 100-year flood height by about 0.08-foot (1-inch). However, the location of a near west interchange on USH 18 within the floodplain of the Crawfish River provides the opportunity to purchase access and development rights to help control future development in the floodplain and river area.

- Alternatives C2, C2(a), and C2(b) and Alternative C3 each require about the same total amount of land, about 417 acres (169 ha). Although Alternatives C2, C2(a), and C2(b) require about 20 acres (8 ha) more farmland, Alternative C3 overall would have a greater farmland loss as its alignment severs farms on a diagonal, thereby leaving more difficult pie-shaped remnants for farming operations.

- Alternative C3 splits the City of Jefferson's north industrial park making future travel and traffic circulation within the park more difficult. Its alignment severs the park on a diagonal, thereby leaving pie-shaped parcels that would be more difficult to develop.

- There is a slightly higher rural residential density east of Jefferson than west. As a result, Alternatives C2, C2(a), and C2(b) would have eight fewer residential relocations than Alternative C3.

- Alternatives C2, C2(a), and C2(b) are about 0.5 mile (0.8 km) shorter than Alternative C3.

In addition, the Preferred Alternative C2(a) possesses several advantages over Alternatives C2 and C2(b), and was selected as the Preferred Alternative based on the following concerns and support from review agencies:

- With wetland impacts of about 15.2 acres (6.2 ha), it would require about 4 acres (1.6 ha) less wetland than Alternatives C2 and C2(b).

- The geometric characteristics of its interchange with USH 18 allow for better compatibility with the local road system and avoids potential conflicts with a nearby school.

- The location of its interchange with USH 18 would require the landlocking of a parcel located between the proposed bypass and the Crawfish River, thereby providing an opportunity for a wetland enhancement project in that parcel, as well as limiting the potential for secondary growth near the interchange.

- Alternative C2(a) is supported by the Town of Jefferson and the City of Jefferson.

6.4.2.3 Alternative C4

Alternative C4 avoids all floodplain impacts, but it was eliminated from further consideration because it lacks several transportation and other benefits provided by other alternatives:

- It impacts the greatest number of wetland acres of all alternatives, a large proportion of which would be medium-high functioning floodplain forest.

- Traffic circulation under this alternative is not desirable from the east since traffic on USH 18 between the City of Jefferson and the interchange on STH 26 would be routed past the St. Coletta establishment through a narrow right-of-way section.

- Alternative C4 received little support from the general public or local officials.

6.5 MEASURES TO MINIMIZE HARM

Minimizing floodplain impacts was a major consideration in the selection of the Preferred Alternative. Further measures will be taken to minimize impacts and mitigate unavoidable impacts.

6.5.1 Minimization Measures

Measures to reduce the impact of the improvement on the regional base flood elevation include: modifications of the cross section and hydraulic conveyance or storage measures.

Under the Preferred Alternative, consideration is being given to development of a wetland mitigation site in the vicinity of the floodplain encroachment. If this area is developed as wetland, the use of culverts or other hydraulic control structures connecting the wetland with the floodplain will be evaluated with the intent of utilizing the flood storage and conveyance capacity of the wetland. Additional discussion of potential wetland mitigation sites is provided in Section 5.3.2.

6.5.2 Mitigation Measures

The principal measures to mitigate unavoidable impacts are: floodplain zoning and regulation to reduce potential risk of property loss or hazard to life, and measures to preserve or restore natural and beneficial floodplain values.

The Wisconsin Administrative Code NR 116 recognizes that floodplain zoning is a necessary tool to protect human life, health, and to minimize property damages and economic losses. Counties, cities, and villages within the State of Wisconsin are required to adopt reasonable and effective floodplain zoning ordinances within their jurisdictions, and such ordinances are in place.

Coordination with WDNR, FEMA, and the U.S. Army COE has been initiated to solicit their comments and to inform these regulatory agencies that the proposed improvement may require revision of official floodplain maps and zoning ordinances. This action would be in conformance with state and local floodplain standards provided that:

- Hydraulic calculations are completed and affected property owners are compensated in accordance with the WisDOT/WDNR Cooperative Agreement as amended in 1995.

- Amendments are made to the official floodplain maps and Jefferson County's floodplain zoning ordinance.

The change in the regional flood elevation would not result in substantial changes to floodplain maps due to the minimal increase. However, the location of the floodplain may differ after new topography is generated for this project.

WisDOT will complete the required analysis to revise the regulated floodplain in accordance with the criteria in Wisconsin Administrative Code NR 116.11 during final design and prior to construction of the facility. WisDOT will coordinate with WDNR and Jefferson County to obtain permission to revise the regulated floodplain and to complete the required revision.

Economic loss as a result of floodplain impacts on crop lands can be mitigated by compensation to riparian property owners for flowage easements. These easements would cover lands currently outside the floodplain but which would be within the revised floodplain. Easements will be acquired in accordance with the detailed process stipulated in the Cooperative Agreement between WisDOT and WDNR as amended July 1995. The actual amount of such compensation would be determined by appraisal at the time of final design, in accordance with procedures and requirements of the Cooperative Agreement.

Natural and beneficial floodplain values associated with wetlands, such as wildlife habitat and floodwater storage, will be mitigated as noted above.

6.6 FLOODPLAIN FINDING

Based on the above considerations, it is determined that there is no practicable alternative to the proposed construction in floodplains, and that the proposed action includes all practicable measures to minimize harm to floodplains which may result from such use.